SEQUENCE LISTING

<110> Wittwer, Carl T.
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      Hillyard, David R.

<120> CONTAINER FOR CARRYING OUT AND MONITORING BIOLOGICAL
      PROCESSES

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<151> 1997-06-04

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```
NEW
1       GOTO 60:REM                     ***I/O stepper (I=$(0), O=z(72))***
3       IF (XBY(65507).AND.64)=0 THEN Z(0)=XBY(65506) : GOTO 3
4       CC   : WHILE (XBY(65507).AND.128)=128
5       I=0 : DO : I=I-1 : XBY(65506)=ASC(S(0),I)
6       WHILE ASC(S(0),I)<>13 : RETURN
7       CC   : WHILE (XBY(65507).AND.64)=64
8       I=0 : DO : Z(I)=XBY(65506)
9       I=I-1 : UNTIL Z(I-1)=13 : RETURN

10      REM     ***error check***
15      IF TX<0 THEN TX=0
16      RETURN
20      IF TX<-251 THEN TX=-251
21      RETURN
25      IF TX>251 THEN TX=251
26      RETURN

30      GOSUB 50:TP1=TP:T1=TIME
32      DO:UNTIL TIME>T1+0.2
34      GOSUB 50:TP2=TP:T2=TIME
36      SL=(TP2-TP1)/(T2-T1) : IF SL<>0 THEN IT=(TG-TP2)/SL
38      PRINT USING(###.##),'SL=',SL,'IT=',IT,'AT TEMP=',TP2
40      IF IT>1 GOTO 30
42      RETURN

49      REM     ***temperature measurement***
50      E=XBY(65504):F=XBY(65505):G=XBY(65504):TP=(F*256+G+300)/38.3:   RETURN

60      CLEAR : STRING 150,72 : DIM Z(72)
72      DTEMP=95:DTIM=1:DS=10
74      ATEMP=60:ATIM=1:AS=20
76      ETEMP=74:ETIM=15:ES=1:CYCLE=100
80      PRINT USING(###),'#',TAB(20),'TEMP',TAB(30),'TIME',TAB(40),'SLOPE'
82      PRINT '1) DENATURATION',TAB(20),DTEMP,TAB(30),DTIM,TAB(40),DS
84      PRINT '2) ANNEALING',TAB(20),ATEMP,TAB(30),ATIM,TAB(40),AS
86      PRINT '3) EXTENSION',TAB(20),ETEMP,TAB(30),ETIM,TAB(40),ES
88      PRINT '4) CYCLES        ',CYCLE:PRINT
110     INPUT 'TYPE # TO CHANGE OR 0 IF OK (CHOICES ARE 0,1,2,3, OR 4)?',J
114     IF J=0 THEN GOTO 170
116     ON J GOSUB ,120,130,150,160
118     PRINT:GOTO 80
120     INPUT 'ENTER DENATURATION Temp, Time, Slope: ',DTEMP,DTIM,DS
125     IF DTEMP>98 GOTO 120
126     RETURN
130     INPUT 'ENTER ANNEALING Temp, Time, Slope: ',ATEMP,ATIM,AS
140     IF AS<0 GOTO 130
142     IF AS>21 GOTO 130
145     RETURN
150     INPUT 'ENTER EXTENSION Temp, Time, Slope: ',ETEMP,ETIM,ES:RETURN
160     INPUT 'ENTER Number of Cycles:',CYCLE:RETURN
170     $(0)='mar1 500;spl 200;hf1 2;ret 1;esc' : GOSUB 3 : GOSUB 7
175     FOR I=0 TO 10 : PRINT CHR(Z(I)), : NEXT I : PRINT

200     $(0)='gol nd;hf1 2;wfo =.x../sl':GOSUB 3:        rem open
210     PRINT 'WAIT FOR COOLING':XBY(65504)=3
220     DO : GOSUB 50 : UNTIL TP<45
230     PRINT 'TEMP=',TP,' LOAD SAMPLES AND THEN PRESS A KEY'
240     W=GET : IF W=0 GOTO 240

300     TMC=0 :W8=0: CLOCK 0 : TIME=0 : DBY(71)=0 : CLOCK 1
305     $(0)='hf1 1;spl 100;gol;wfo =x.../sl':GOSUB 3:          REM CLOSE
310     FOR V=1 TO CYCLE
315     PRINT 'D', : TG=DTEMP:XBY(65509)=4:IF V=1 THEN TG=DTEMP+(DS/4)
```

```
320    WS=(DS*10+WS*9)/10:TX=INT(WS+0.5):GOSUB 15
325    XBY(65508)=TX:GOSUB 50:IF TP>TG GOTO 340
330    IF TX<>DS*10 GOTO 320
333    GOSUB 30
335    GOSUB 50:IF TP<TG GOTO 335
340    TG=DTEMP:EB=TIME
345    WS=(3*WS+10*(TG-TP))/7 :TX=INT(WS+0.5)
350    IF TX>=0 THEN GOSUB 35:XBY(65508)=TX:XBY(65509)=4
355    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
360    IF V=1 THEN IF DTEMP-5>(TIME-EB) GOTO 380
370    IF DTIM<(TIME-EB) GOTO 500
380    GOSUB 50 : GOTO 345

500    PRINT 'A',:XBY(65508)=0:TG=ATEMP
845     S(0)='spl 200;sol nd;hd1 2;wfo =.x..;sl':GOSUB 3:          rem open
855    XBY(65509)=AS*10
860    GOSUB 30
890    EB=TIME:WS=-AS*10
913    WS=(4*WS+20*(TG-TP))/5:TX=INT(WS+0.5)
915    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
918    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
920     IF ATIM+1<(TIME-EB) GOTO 925
924    GOSUB 50 :  GOTO 913

925    PRINT:PRINT 'B ',:XBY(65509)=4:TG=BTEMP+1
930    S(0)='hd1 1;spl 50;sol;wfo =x...;sl':GOSUB 3:WS=0:  REM CLOSE
935    WS=(ES*10+WS*9)/10:TX=INT(WS+0.5):GOSUB 15:GOSUB 25:XBY(65508)=TX
937    GOSUB 50:IF TP>TG-1 GOTO 970
940    IF TX<>ES*10 GOTO 935
950    GOSUB 50 :  IF TP<TG-1 GOTO 950
970    EB=TIME
980    WS=(WS+5*(TG-TP))/3 :TX=INT(WS+0.5)
983    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
987    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
990     IF DTIM<(TIME-EB) GOTO 1000
995    GOSUB 50 : GOTO 980
1000   CTIM=TIME-TMC : TMC=TIME :  PRINT 'CYCLE=',V,'TIME=',CTIM
1050   NEXT V

1055   XBY(65508)=0:XBY(65509)=255
1060    INPUT 'STRAND REANNEALING (Y/N) ?',S(1)
1070     IF ASC(S(1),1)=78 GOTO 1190
1100   PRINT 'STRAND REANNEALING IN PROCESS...'
1110    TG=DTEMP:XBY(65509)=4
1120    WS=(DS*10+WS*9)/10:TX=INT(WS+0.5):GOSUB 15
1130   XBY(65508)=TX:GOSUB 50:IF TP>TG GOTO 1170
1140    IF TX<>DS*10 GOTO 1120
1150    GOSUB 30
1160    GOSUB 50:IF TP<TG GOTO 1160
1170    EB=TIME
1180    WS=(11*WS+10*(TG-TP))/12 :TX=INT(WS+0.5)
1185    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
1190    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
1193     IF 5<(TIME-EB) GOTO 1200
1196    GOSUB 50 :  GOTO 1180
1200   XBY(65508)=0:XBY(65509)=255:WS=0
1210   DO:GOSUB 50:UNTIL TP<75

1220   EB=TIME
1230   WS=(WS+3*(75-TP))/3 :TX=INT(WS+0.5)
1240    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
1250    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
1260     IF 60<(TIME-EB) GOTO 1280
1270    GOSUB 50 :  GOTO 1230
```

Temperature processor(IC 2) hex file (Temp24a.hex):

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Stepper processor(IC 3) hex file(Step23.hex):

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Serial snoop processor(IC 16) hex file(Serial5.hex):

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